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1,991,568

APPARATUS FOR PRODUCING DRY GAS FROM LIQUID

Filed Jan. 23, 1933

2 Sheets-Sheet 1

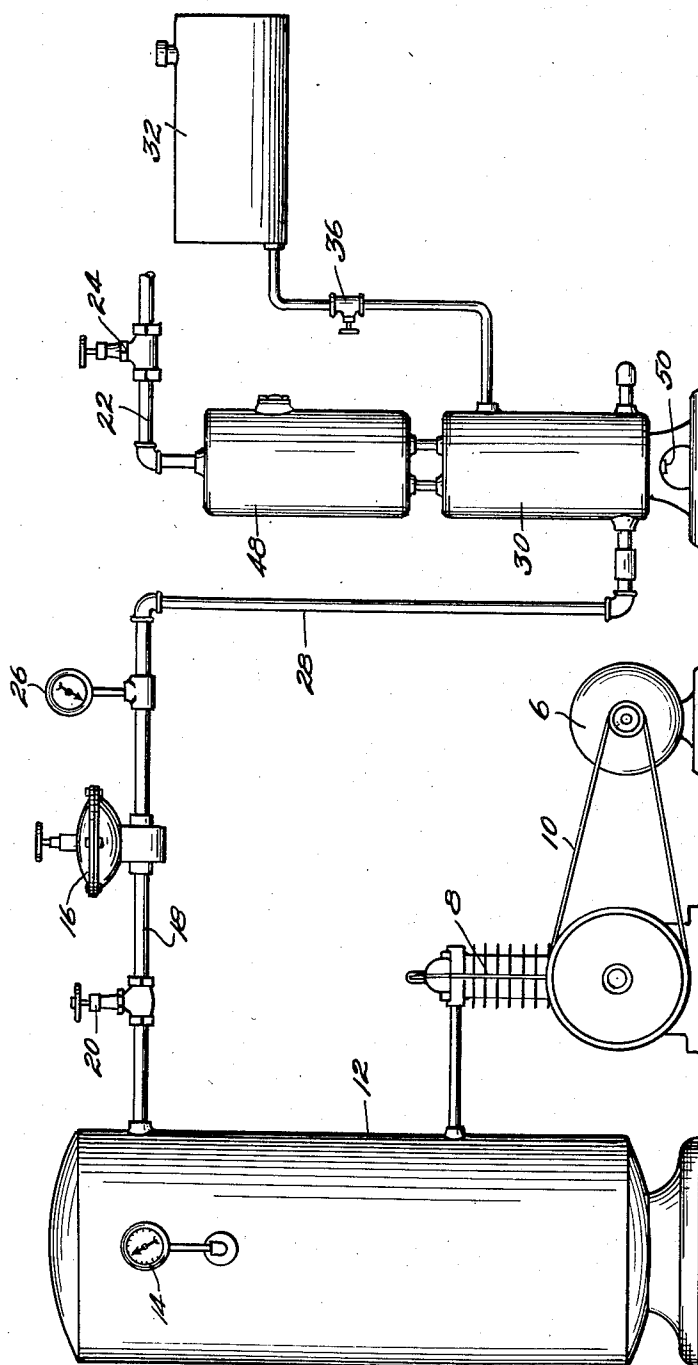


Fig. 1

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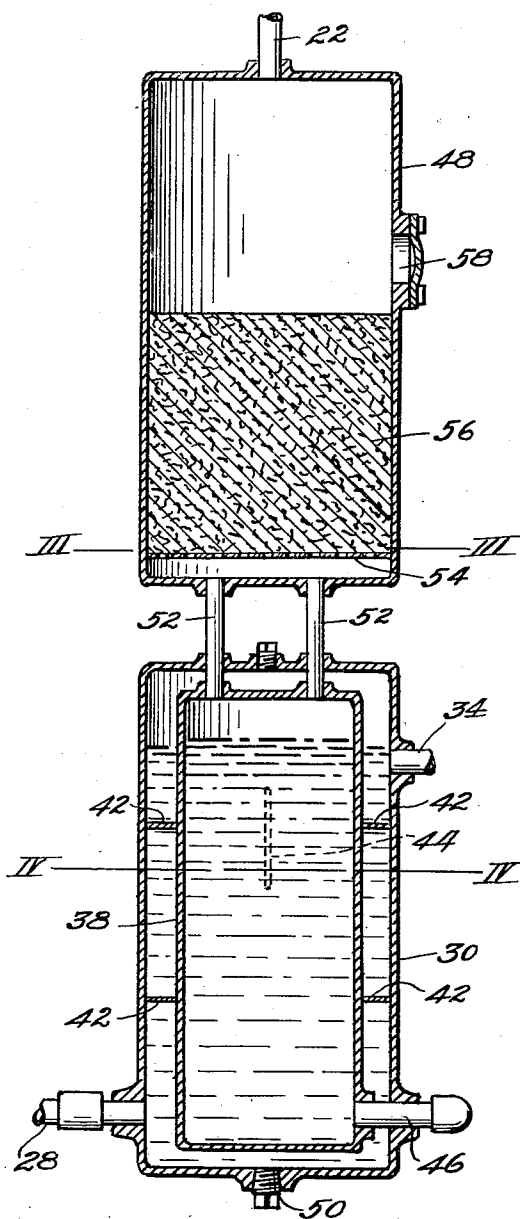


Fig. 2

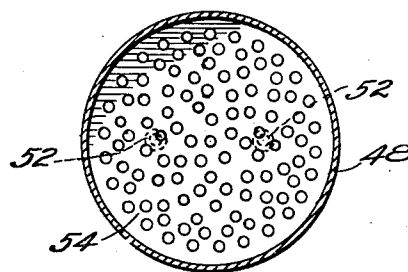


Fig. 3

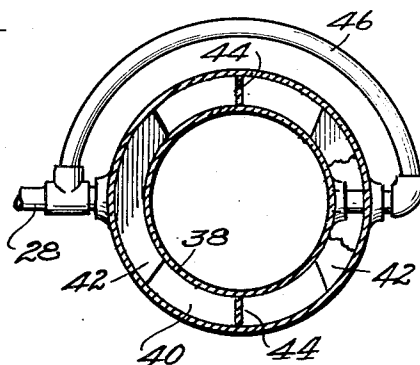


Fig. 4

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APPARATUS FOR PRODUCING DRY GAS
FROM LIQUID

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4 Claims. (Cl. 261—121)

This invention relates to gas producing apparatus, and the primary object of this invention is the provision of novel constructed equipment for the production of dry gas from liquid hydrocarbon that not only allows the continuous production of dry gas, but produces a large volume of the same by utilizing a comparatively few number of parts whereby a gas usable as a fuel may be economically made.

One of the primary objects of this invention is the provision of unique means for intermixing liquid hydrocarbon and air, said means being associated with a combined conditioning and collecting reservoir having therein a dehydrator which removes all moisture from the hydrocarbonized air prior to its being released into the supply means.

One of the important aims of the instant invention is the contemplation of specially constructed and unique mixing equipment which will handle in an effective manner, a liquid hydrocarbon and air under pressure so that one passage of the air through the plant will create a supply of gas having the property of so-called natural gas.

Minor objects of the invention, including details of construction, will appear during the course of the following specification, referring to the accompanying drawings, wherein but a single embodiment of the invention is shown, and wherein:

Figure 1 is a diagrammatical view of a gas producing plant constructed to embody the features of this invention.

Fig. 2 is a vertical, central section through the mixing and conditioning tanks of the plant.

Fig. 3 is a cross section taken on line III—III of Fig. 2, and,

Fig. 4 is a similar section, but taken on line IV—IV of Fig. 2.

It must be understood that various forms of devices might be employed in creating a gas making system for the production of dry gas in accordance with this invention and that but one system is herein specifically set forth.

This method and apparatus for producing dry gas is particularly adapted for utilizing gasoline and it is due to the proper intermixing of gasoline and air that a valuable gas is created. In a system contemplated, there must be means for establishing and maintaining a flow of air under a given and predetermined constant pressure. Means whereby this might be accomplished is clearly shown in Fig. 1, and may consist of an electrically driven motor 6 that it connected to

an air compressor 8 by a driving belt 10. Compressor 8 maintains air in storage tank 12 and a pressure gauge 14 will indicate the pressure built up in said tank. From tank 12 the air under pressure passes to a pressure reducing valve 16 by way of pipe 18 and when valve 20 is open. This pressure reducing valve 16 may be of the diaphragm type and should be set so that a relatively low pressure of approximately eight ounces is maintained in the system from valve 16 on to the pipe 22 which leads to any point of consumption.

A valve 24 in this pipe line may be used if desired. A gauge 26 will indicate any fluctuation of pressure which might take place beyond pressure reducing valve 16 and it is from this gauge 26 that pipe 28 leads to the novel mixing tank 30. This mixing tank is constructed as specifically shown in Fig. 2, and means is provided in the same for thoroughly saturating the air passing therethrough with hydrocarbon. This saturation takes place to the extent that a combustible gas of high quality is produced.

Gasoline or other suitable liquid hydrocarbon is maintained in storage tank 32 and introduced into mixing tank 30 through the medium of a conduit 34, valved as at 36. It is preferred that conduit 34 enter mixing tank 30 at approximately one-fourth its length below the top of the tank. As shown in Fig. 2, conduit 34 terminates just inside the wall of mixing tank 30. The interior of tank 30 is provided with an inner compartment 38, the walls of which are completely spaced from the inner face of the walls of tank 30 by supports 42 and 44. Such disposition creates outer compartment 40 between inner compartment 38 and the inner face of the walls of tank 30, and it is into this compartment 40 that the liquid hydrocarbon is lead by conduit 34.

Pipe 28 enters tank 30 near the bottom thereof and terminates as shown in Fig. 2 so that only a small quantity of air sufficient to form a compressed air cushion at the top will enter compartment 40. In order to supply liquid hydrocarbon to the interior of inner compartment 38 and to supply air to this compartment as well, this invention contemplates the use of a supply pipe 46, which connects with pipe 28 just outside of tank 30 and leads through the wall thereof at a point substantially diametrically opposite to the connection of pipe 28 with said tank 30 and thence through compartment 40 and into inner compartment 38. Thus when an equal pressure is established throughout the parts of the sys-

tem, liquid hydrocarbon will flow from storage tank 32 through conduit 34 and into compartment 40, from whence it will flow through supply pipe 46 and into inner compartment 38.

5 During the operation of the system and when the valves are opened and set for such operation, supply pipe 46 is directly in communication with and interconnects both compartment 40 and inner tank 38 and thereby tends to keep filled
10 with gasoline. Air from pipe 28 cannot flow into compartment 40 because this compartment is completely closed, excepting for the gasoline supply pipe 34 and because tank 32 is of sufficient height, air cannot bubble back through this tank.
15 Consequently, the air entering through pipe 28 flows through pipe 46 in bubbles and then through the gasoline in the inner tank, hence through the dehydrator 56 in reservoir 48 to the point of use, which is reached by pipe 22. Air
20 pressure in the top of compartment 40 is equal to the air pressure in pipe 28, minus the head of liquid in compartment 40. This pressure normally holds back the flow from tank 32. However, as the gasoline is vaporized, its surface in
25 compartment 40 is lowered to a point beneath the entrance of pipe 34. Upon such lowering more gasoline will flow from tank 32 to raise the level in compartment 40 and hold the air in a compressed state between the surface of the gasoline and the top of outer tank 30.

A drain plug 50 may be provided at the bottom of tank 30. Connectors 52 join the lowermost part of reservoir 48 with the uppermost part of inner compartment 38 and it is through these
35 connectors 52 that the hydrocarbonized air passes. A screen 54 positioned a slight distance above the bottom of reservoir 48 divides the reservoir into two compartments, i. e., upper and lower compartments and will allow a spreading of
40 the moist gas so that the full effect of the dehydrant 56 might be realized. This dehydrator rests upon screen 54 and may consist of brass or copper cuttings, steel wool, asbestos or any other substance that will have a dehydrating effect to
45 the extent of removing the moisture from the gas as it passes into reservoir 48 through connectors 52. A filler opening 58, capped as shown, should be formed in the side of reservoir 48, and this reservoir should be of sufficient size to serve as a
50 collecting means for the conditioned dry gas that is ready for use. From the upper part of this reservoir 48 the dry gas is drawn and sent to the point of consumption through the aforementioned pipe 22.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a gas generating device, an outer tank closed at its top; an inner tank having an outlet for gaseous fuel near its top, within and spaced from said outer tank; an inlet pipe for liquid fuel leading into said outer tank, and having its outlet spaced from the top of said outer tank; conduit means connecting the lower portions of said inner and outer tanks; and means for supplying air under pressure coupled to the said conduit means.

2. In a gas generating device, an outer tank closed at its top; an inner tank having an outlet for gaseous fuel near its top, within and spaced from said outer tank; an inlet pipe for liquid fuel leading into said outer tank, and having its outlet spaced from the top of said outer tank; conduit means connecting the lower portions of said inner and outer tank; and means for supplying air under pressure coupled to the said conduit means, said conduit means joining the said inner and outer tanks at diametrically opposite points of connection.

3. In a gas generating device, an outer tank closed at its top; an inner tank having an outlet for gaseous fuel near its top within and spaced from said outer tank; an inlet pipe for liquid fuel leading into said outer tank and having its outlet spaced from the top of said outer tank; conduit means connecting the lower portions of said inner and outer tanks; means for supplying air under pressure coupled to the said conduit means; a reservoir, having a dehydrator therein above said inner tank; and means interconnecting said inner tank and reservoir.

4. In a gas generating device, an outer tank closed at its top; an inner tank having an outlet for gaseous fuel near its top within and spaced from said outer tank; an inlet pipe for liquid fuel leading into said outer tank and having its outlet spaced from the top of said outer tank; conduit means connecting the lower portions of said inner and outer tanks; means for supplying air under pressure coupled to the said conduit means; a reservoir, having a dehydrator therein above said inner tank; a transverse screen dividing said reservoir into two compartments; and means interconnecting said inner tank and reservoir.

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